VERMONT
ENVIRONMENTAL CONSERVATION

Drinking Water & Groundwater Protection Division

GUIDANCE SHEET / INTERACTIVE FORM

Conducting an Operational Evaluation & Preparing an Operational Evaluation Report

The purpose of the Operational Evaluation Level (OEL) is to allow a system to take action to reduce elevated Disinfection Byproduct (DBP) levels in the system before a violation of the Maximum Contaminant Level (MCL) computed as a Locational Running Annual Average (LRAA) occurs.

The OEL is calculated by using the DBP analytical data collected each quarter by the system for the current and previous two quarters. That value is then compared to the MCLs for TTHM and for HAA5. If the OEL exceeds the MCL, the system is required to conduct an investigation and write a report that's submitted to the Vermont Drinking Water & Groundwater Protection Division.

DBP MCLs
TTHM LRAA > 0.080 mg/L
HAA5 LRAA > 0.060 mg/L
At each monitoring location

Listed below are the various areas in a system that could contribute to DBP formation. Each area must be evaluated and addressed in the report, unless allowance to limit the scope of the evaluation has been requested in writing by the system and approved in writing by the Division. The report must be submitted to the Vermont Drinking Water & Groundwater Protection Division within 90 days of the OEL exceedance, must be made available to the public upon request, and must be retained by the system for 10 years.

Note: The system is to complete this evaluation and report. A consultant can be used but is not required to develop this OEL Report.

System Information

Name of PWS: _____ **PWSID:** VT_____

Date written report due to the Vermont Drinking Water & Groundwater Protection Division (90 days after being notified of the sample result that caused the exceedance - not the end of the quarter) Day: _____ Month: _____ Year:_____

Beginning period for evaluation
(1st sample quarter included in the OEL): Month: _____ Year: _____

Number of sites sampled: _____

Has an OEL been completed for this system previously? Yes ☐ **No** ☐
If so, when was this report submitted? Day: _____ Month: _____ Year: _____

Number of sites above the OEL: _____

Which result(s) caused the OEL exceedance? **TTHM** ☐ **HAA5** ☐ **OEL =** _____ **OEL =** _____

Sample Point ID(s) and Sample Location(s) where the OEL was exceeded: _____

Note 1: Complete the Operational Evaluation Level Worksheets on page 4.
Note 2: The sample point ID and sample location should correspond to a site in your approved Stage 2 DBP Compliance Monitoring Plan.

Steps in the Process

☐ Confirm that the samples were properly collected from the approved sampling plan locations, preserved, and analyzed. Did the lab report include additional information about the sample results that might indicate a delivery or laboratory problem?
☐ Review the TTHM and HAA5 data from the other sites to determine if the exceedance is localized or system-wide.
☐ If the cause of the OEL exceedance is known, request approval from the Vermont Drinking Water & Groundwater Protection Division in writing to limit the scope of the operational evaluation report.
☐ Evaluate the system. The entire system must be evaluated unless a limited scope is approved by the Vermont Drinking Water & Groundwater Protection Division in writing.
☐ Identify steps to reduce the TTHM and HAA5 levels in the system in the future.
☐ Prepare the report and submit it in writing to the Vermont Drinking Water & Groundwater Protection Division by the 90-day deadline.

System Evaluation and Possible Contributing Factors

There are three major areas to review in a public water system for the OEL report. Listed below are many of the factors within each area to consider when evaluating that part of the system to determine what could have contributed to elevated disinfection byproduct levels. In general, warmer water temperature, lengthy water age, increased disinfectant levels (especially free chlorine), and increased organic carbon levels (e.g., algal blooms in surface water), can all contribute to increased disinfection byproduct levels.

You may want to check the possible pertinent factors as you read through the following list of factors that could have contributed to elevated disinfection byproduct levels in your system.

> ***Note for 100% Consecutive Systems:*** *If your system does not add any chemical to the water purchased from another system, you do not need to consider the source or treatment factors. However, if you have knowledge of something in those two areas that could have affected your system's disinfection byproduct levels, please include that information in your report.*

1. Source Water

Was there anything unusual that was noticed in the source water? **Yes** ☐ **No** ☐

If yes, provide details and explain below: (please feel free to use additional sheets appended to this form as necessary)

Considerations include:

Surface water systems: ☐Heavy rain event, ☐algal blooms, ☐lake turnover, ☐color change, ☐taste & odor incident, ☐lower river/reservoir/lake levels than normal, ☐elevated water temperature, ☐use of different source, or ☐ other.

Groundwater systems: ☐Drought, ☐taste & odor incident, ☐color change, ☐unusually high pumpage, ☐elevated water temperature, ☐use of different source, or ☐ other.

2. Treatment Process

Was there anything unusual that was noticed in the treatment process? **Yes** ☐ **No** ☐

If yes, provide details and explain below: (please feel free to use additional sheets appended to this form as necessary)

Considerations include:

Surface water systems: ☐Elevated DBP precursor levels (TOC, DOC, SUVA), ☐unusual turbidity levels (raw, Individual Filter Effluent, or Combined Filter Effluent), ☐longer pre-sedimentation detention times, or ☐ other.

All systems: ☐Elevated finished water temperature, ☐chlorine feeds were outside normal range, ☐change in disinfectant used, ☐changes in treatment processes, ☐reduced coagulant feeds, ☐changes in process controls, ☐changes in disinfection application points, ☐changes in treatment chemicals, ☐maintenance activities such as changing out filter media, ☐changes in flow rates, ☐any upsets in the routine treatment processes, ☐longer detention times in the clearwell, or ☐ other.

3. Distribution System

Was there anything unusual that was noticed in the distribution system or storage reservoirs? **Yes** ☐ **No** ☐

If yes, provide details and explain: (please feel free to use additional sheets appended to this form as necessary)

Considerations include:

All systems: ☐Sudden increase in chlorine feed at booster stations, ☐increased detention time in reservoirs, ☐changes in disinfectants, ☐changes in chlorine residuals, ☐changes in customer usage particularly with the addition or loss of large customers, ☐changes in storage management practices (elevated or ground storage), ☐switch between free chlorine and chloramine for the burnout period, ☐line break or main replacement in the vicinity of the sampling location, ☐maintenance of reservoirs, ☐flushing or valve exercising activities in the vicinity of the sampling location, ☐lack of a flushing or valve exercising program, ☐unusual storage drawdown or changes in water level fluctuations that could have increased water age in the storage facility or system, ☐unusually high ambient air temperatures, ☐changes in hydraulic flow in the system, ☐additions to the distribution system, ☐customer complaints related to water quality, or ☐ other.

Possible Remedies that could Reduce Levels of Disinfection Byproducts

For those areas or factors that might have contributed to increased disinfection byproduct levels, what can be done to reduce these levels in the future and avoid a violation of the TTHM or HAA5 maximum contaminant level? List the possible remedies within the control of the system for the factors previously identified.

Example from Anytown, VT: Lengthy water age (older water) due to excessive storage capacity in the reservoir/tank is thought to be a factor; the remedy could be to manage the storage capacity differently (reducing the water level in the reservoir/tank, installing a mixer in the reservoir/tank, etc.).

Write the Report

- List the factors thought to be related to the increased disinfection byproduct levels.
- List the possible remedies to reduce those levels that could be instituted by the system. Include both short-term (e.g., flushing) and long-term (e.g., installing tank mixer in tower) remedies.
- See EPA's "Guidance Manual for Conducting the Operational Evaluation" for more information on specific factors and remedies at: http://www.epa.gov/ogwdw/disinfection/stage2/pdfs/draft_guide_stage2_operationalevaluation.pdf
- Submit the written report to the Vermont Drinking Water & Groundwater Protection Division by the 90-day deadline.

Next Steps

The Vermont Drinking Water & Groundwater Protection Division will evaluate this report for adequacy and will return comments for consideration by the system. In the meantime, if there is an action that the system can take to reduce the generation of disinfection byproducts before the next compliance sample(s) is/are collected and that action does not reduce the system's disinfection protection, the system may take that action.

Examples of actions that a system could take without seeking approval from the Vermont Drinking Water & Groundwater Protection Division would be to:

- enact a flushing program to reduce water age in a low-use area, or,
- manage the storage capacity to encourage turnover and reduce water age.

Examples of actions that are not acceptable to take without first receiving Vermont Drinking Water & Groundwater Protection Division approval include:

- to change the type of disinfectant,
- to change the point of disinfection, or,
- to have disinfectant residuals that are below the required minimum levels.

If you have questions about what can be done without approval, please contact the Vermont Drinking Water & Groundwater Protection Division person listed in the cover letter or on the Division's Website (provided in the box on the last page of this form).

Operational Evaluation Level Worksheets

The following worksheets are used to determine whether or not TTHM and HAA5 Operational Evaluation Levels are exceeded:

TTHM Data					
	Results from 2 Quarters Ago	Results from Last Quarter	Results from Current Quarter	Operational Evaluation Level	Need to conduct evaluation? (Yes if D > 0.080 mg/L)
Stage 2 Sample Site (Sample Point ID & Location)	**A**	**B**	**C**	**D = [A + B + (2 * C)] / 4**	**Yes OR No**
(TH001)					
(TH002)					
(TH003)					
(TH004)					
(TH005)					
(TH006)					

HAA5 Data					
	Results from 2 Quarters Ago	Results from Last Quarter	Results from Current Quarter	Operational Evaluation Level	Need to conduct evaluation? (Yes if D > 0.060 mg/L)
Stage 2 Sample Site (Sample Point ID & Location)	**A**	**B**	**C**	**D = [A + B + (2 * C)] / 4**	**Yes OR No**
(HA001)					
(HA002)					
(HA003)					
(HA004)					
(HA005)					
(HA006)					

VERMONT
ENVIRONMENTAL CONSERVATION

OPERATIONAL EVALUATION REPORT

Drinking Water & Groundwater Protection Division

I. GENERAL INFORMATION

A. Water System Information:

PWSID	VT				
PWS Name					
PWS Address					
City		State	VT	Zip Code	

B. Report Prepared by:

Name			
Title			
Date Prepared			
Telephone	( ) -	Email	

II. MONITORING RESULTS

A. Provide the compliance monitoring location where the operational evaluation level (OEL) was exceeded (if there was more than one location where the OEL was exceeded, attach an additional copy of this page, and complete Items II.A. and II.B. for each additional location).

Note: The location name or number should correspond to a location name or number in your Stage 2 D/DBPR compliance monitoring plan required under 40 CFR 141.622.

B. Monitoring Results for the Location Identified in Item II.A.

1. Check TTHM and/or HAA5 to indicate which result(s) caused the OEL exceedance: ☐ TTHM ☐ HAA5
2. Enter your results for TTHM and/or HAA5 (whichever you checked above).

	Quarter			Operational Evaluation Value*
	Result from This Quarter	Result from Previous Quarter	Result from 2 Quarters Ago	
	A	B	C	D = [A + B + (2 * C)] / 4
Date sample was collected	/ /	/ /	/ /	
TTHM (µg/L)				
HAA5 (µg/L)				

** The operational evaluation value is calculated by summing the two previous quarters' TTHM or HAA5 results plus twice the current quarter's TTHM or HAA5 result and then dividing by four. If the value exceeds 80 µg/L for TTHM or 60 µg/L for HAA5, an OEL exceedance has occurred.*

III. OPERATIONAL EVALUATION FINDINGS

A. Has the Division already given approval for you to limit the scope of your operational evaluation? ☐ **Yes** ☐ **No**
If NO, proceed to Items III.B. through III.D and Item IV. If YES, address ONLY the section(s) below within the modified scope previously given approval.

B. Did **distribution operational practices**—including storage tank operations, excess storage capacity, and distribution system flushing—cause or contribute to your OEL exceedance(s)? ☐ **Yes** ☐ **No** ☐ **Possibly**

If YES or POSSIBLY, explain (attach additional pages if necessary).

Note: Refer to Chapter 3 in the USEPA's Stage 2 D/DBPR Operational Evaluation Guidance Manual.

C. Did **treatment operational practices**—including treatment changes or problems—cause or contribute to your OEL exceedance(s)? ☐ **Yes** ☐ **No** ☐ **Possibly**

If YES or POSSIBLY, explain (attach additional pages if necessary).

Note: Refer to Chapter 4 in the USEPA's Stage 2 D/DBPR Operational Evaluation Guidance Manual.

D. Did **source water**—including changes in sources or source water quality—cause or contribute to your OEL exceedance(s)? ☐ **Yes** ☐ **No** ☐ **Possibly**

If YES or POSSIBLY, explain (attach additional pages if necessary).

Note: Refer to Chapter 5 in the USEPA's Stage 2 D/DBPR Operational Evaluation Guidance Manual.

IV. POSSIBLE REMEDIES

Below, list steps that were considered to minimize DBP formation and future OEL exceedances. Include both short-term (*e.g.,* flushing) and long-term (*e.g.,* installing tank mixer in tower) remedies. (Attach additional pages as necessary).

Send the completed report to the Vermont Drinking Water & Groundwater Protection Division at the following address:

Fax: **802-828-1541**
Mail: **Vermont Department of Environmental Conservation**
Drinking Water & Groundwater Protection Division
1 National Life Drive, Main 2
Montpelier VT 05620-3521

Attn: DBP Rule Manager (OEL Report)

E-Mail: **doug.kievit-kylar@state.vt.us** **(send report as file attachment)**

This form and related environmental information are available electronically via the Internet. For information visit us through the Vermont Homepage at http://www.vermont.gov or visit the Division directly at http://www.drinkingwater.vt.gov/

Vermont Department of Environmental Conservation
Drinking Water and Groundwater Protection Division
One National Life Drive - Main 2
Montpelier, VT 05620-3521

Phone: 802-585-4891 (or 800-823-6500 Toll-Free in Vermont)